corresponding delay attribute. Thus, channel coefficient C_{jk} may be represented by the polynomial $C_0 + C_1 z^{-1} + C_2 z^{-2} + \ldots + C_{n-1} z^{-(n-1)}$, where C_n represents the channel coefficient associated with a single multipath and z^x is a delay operator that represents the unit delay of the various multipaths relative to the first received multipath. The time delay operator could be expressed relative to a multipath other than the first received multipath, in which case the above expression might include channel coefficients with positive delay elements (e.g., $C_x z^{+4}, C_{x-1} z^{+3}$, and so on).

a1 cont

Please replace the paragraph beginning on line 12 of page 20 with the following paragraph.

The IIR processed blocks are then FIR processed by matrix multiplication with the adjoint matrix polynomials to obtain transmit signal blocks. Filter array 32 comprising FIR filters 34 process the IIR-filtered signals to compensate for interference between signals S_1, S_2, and S_3 at the mobile terminals 16. Each signal is processed by a corresponding row of FIR filters 34 in the FIR filter array 32. The output signals from FIR filters 34 are summed down filter array columns, indicated by the + sign at the junction of the line from one output to another. These summed outputs represent the baseband combined transmit signals relayed by the transmit processor 18 to the modulators 22A … 22N used to generate transmit signals T_1 … T_N, which are in turn transmitted by transmit antennas 14A … 14N.

a2

Please replace the paragraph beginning on line 3 of page 22 with the following paragraph.

a3

Fig. 3 is a flowchart illustrating the operation of the transmit processor 18 located in the network 10 for determining the coefficients of the IIR filters 30 and

a3 cont

FIR filters 34 based on channel state information (CSI). Processing begins (block 200) with updating the CSI information to reflect latest estimates of the downlink channel z-polynomials comprising the channel estimate matrix *C*.

Please replace the paragraph beginning on line 19 of page 23 with the following paragraph.

a4

When practicing the present invention, it is desirable to group mobile terminals 16 using the same communication channel relative to a group of three neighboring base stations 12. Fig. 5 illustrates the difference between desirable and less desirable groupings. Forming group 1 as comprising the three mobile terminals 16 which are nearest to their respective base stations 12 obtains the most desirable groupings. This can be considered as producing a propagation loss matrix with the least loss along the diagonal. Then group 2 comprises the three mobiles with the second least loss to a respective one of the three base stations; while group 3 comprises the three mobiles with the third lowest loss to their respective base stations, and so on.

Please replace the paragraph beginning on line 5 of page 33 with the following paragraph.

a5

Alternatively, the simpler approach of adding flattening or over flattening zeros can be used. In the case of high-Q determinant poles, i.e. roots very close to the unit circle, a flattening zero may be placed exactly over the pole to annihilate it. Instead of adding a zero then, a pole is annihilated from the determinant instead (block 234). On the other hand if one of the L poles closest to the unit circle is a low-Q pole, the attenuation frequency response may not show a peak exactly on the pole frequency but will be displaced due to the influence of the adjoint matrix FIR polynomials. In that case a zero is centered on the displaced peak and does not annihilate the nearby pole (block 236).

Please replace the paragraph beginning on line 11 of page 34 with the following paragraph.

Maintaining the simplifying assumption of equal phase and amplitude on all nine paths, the adjoint of this matrix is:

a6

$$\begin{bmatrix} z^{-3}-1 & z^{-3}-z^{-6} & 0 \\ 1-z^{-3} & z^{-2}-z^{-3} & z^{-4}-1 \\ 0 & z^{-4}-1 & z^{-1}-z^{-5} \end{bmatrix} \qquad \text{(Eq. 15)}$$

and the determinant polynomial is $-1 + z^{-3} + z^{-4} - z^{-7} = -(1 - z^{-4})(1 - z^{-3})$. The determinant has all seven roots on the unit circle at:

$z = 1$ (two roots)

$z = -1$

$z = j$

$z = -j$

$z = \exp(j120^0)$

$z = \exp(j240^0)$

Each root represents a frequency at which infinite attenuation can arise between the transmitting system and the mobile terminal 16, so it is inefficient to attempt to convey energy at those frequencies to the mobile terminals 16.

Please replace the paragraph beginning on line 5 of page 35 with the following paragraph.

a7

To avoid this problem, all seven roots on the unit circle are optionally annihilated by zeros in the numerator, which is the same as deleting the roots of the determinant. Annihilating all seven roots could cause the equalizers in the mobile terminals 16 to have to deal with an effective channel length (delay) equal to seven symbol periods of delay—keeping in mind that not dividing by one or more factors in the determinant polynomial is the equivalent of multiplying in the

numerator by those omitted factors. All the adjoint matrix elements however share at least one root with the determinant that can be annihilated. Canceling the factor $-1+z^{-1}$ from both the adjoint matrix and the determinant polynomial leaves:

a7 cont

$$\begin{bmatrix} (1+z^{-1}+z^{-2}) & -z^{-3}(1+z^{-1}+z^{-2}) & 0 \\ -(1+z^{-1}+z^{-2}) & -z^{-2} & (1+z^{-1}+z^{-2}+z^{-3}) \\ 0 & (1+z^{-1}+z^{-2}+z^{-3}) & -z^{-1}(1+z^{-1}+z^{-2}+z^{-3}) \end{bmatrix} \quad \text{(Eq. 16)}$$

The determinant is now being $(1 - z^{-4})(1 + z^{-1} + z^{-2})$. Not dividing by the 6th order reduced determinant means that the mobile terminals 16 will receive their signals modified by a 6th order FIR filter, and their equalizers must be able to deal with 7 symbol periods of delay.

Please replace the paragraph beginning on line 8 of page 39 with the following paragraph.

Fig. 6 plots the determinant polynomial and the flattened polynomial obtained by deleting the four roots closest to the unit circle. The coefficients of the example polynomial are given in Table 2 below:

a8

TABLE 2: COEFFICIENTS OF POLYNOMIALS		
COEFFICIENT	REAL	IMAG
A(1)	-0.01492	0.01770
A(2)	0.01484	-0.02824
A(3)	0.02419	-0.08202
A(4)	0.00808	-0.01929
A(5)	-0.04147	-0.15490
A(6)	0.36312	0.11521
A(7)	0.44006	0.19125
A(8)	0.58783	0.88261
A(9)	0.22755	0.01047
A(10)	0.33422	1.09935
A(11)	0.22015	-0.36053
A(12)	-0.67517	0.61808
A(13)	0.15489	-0.26555
A(14)	-0.12943	-0.13633

The roots in Z of the above polynomial were found by the above computer analysis to be:

TABLE 3: ROOTS OF POLYNOMIALS				
	REAL	IMAG	|LOGMAGNITUDE|	
ROOT(1)	0.62535	-0.07880	0.46157	
ROOT(2)	0.35251	0.94711	0.01053	DELETE
ROOT(3)	-0.21019	0.26791	1.07728	
ROOT(4)	0.47505	1.6884	0.56192	
ROOT(5)	-0.57159	0.7985	0.01816	DELETE
ROOT(6)	-1.07257	0.84329	0.31070	
ROOT(7)	-1.76889	0.60238	0.62521	
ROOT(8)	0.34753	-0.64730	0.30831	
ROOT(9)	-1.10402	-0.95889	0.38001	
ROOT(10)	-0.34591	-1.29541	0.29327	DELETE
ROOT(11)	0.22513	-1.10904	0.12369	DELETE
ROOT(12)	1.95558	-0.38249	0.68946	
ROOT(13)	2.43781	-0.97210	0.96488	

a8 cont

The four roots of magnitude closest to unity were determined by comparing the values of ABS(REAL(CLOG(ROOT(I)))), where the complex logarithm function "CLOG" returns a real part equal to the logmagnitude. Thus, the preceding expression returns the absolute value of the real portion equal to the logmagnitude of the complex value. The roots with the smallest absolute value of this logmagnitude are ROOT(5), ROOT(2), ROOT(11) and ROOT(10) and were deleted to produce the flattened curve of the reduced determinant.

Please replace the paragraph beginning on line 20 of page 40 with the following paragraph.

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a9

The nine frequency responses of Figure 7B can also be combined in threes by adding their power responses to determine how much power in total is being used to transmit to each mobile terminal 16, as shown in Figure 7C. The integral of the power spectral curves yields the total power used for transmitting the intended signals to each mobile terminal 16. These powers can be compared to the powers that would have been necessary to communicate the